

Film vs Digital - John Kossik

THE CONTENDERS



In an effort to prove to myself, my family, and my friends that I am not nuts to lug 6+ pounds of medium format camera gear up the mountainside I conducted my own tests over the last few weeks on the resolving capabilities of various film and digital formats.

The contenders were:

1. Sprint Galaxy S III cellphone camera.
2. Nikon D300 with Nikkor AF 35-70 f/2.8 and Nikkor AF 70-200 f/2.8.
3. Nikon F4 with Nikkor AF 35-70 f/2.8 and Nikkos AF 70-200 f/2.8.
4. Mamiya RB67 Pro S with Mamiya Sekor 90mm f3.8 and Mamiya KL 250mm f/4.5.

I shot Kodak Ektar 100 in the film cameras and shot the D300 at 200 ISO and LO 1 (supposedly equivalent to 100 ISO). I tried to shoot both the film and digital cameras at as close to the same shutter speeds and apertures as possible but I have to admit

that this was not always the case. The cellphone was shot in automatic. All were, except the Galaxy 3, shot off a tripod in mirror up mode.

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To try to get the field of view the same for all shots:

1. The Mamiya RB67 Pro S was shot with my Mamiya Sekor 90mm f3.8 that has a 35mm film field of view of 44mm.
2. The Nikon D300 was shot with my Nikon AF 35-70 F2.8 at 35mm which has a 35mm film field of view of 53mm.
3. The Nikon F4 was shot with my Nikon AF 35-70 F2.8 at 53mm which has a 35mm film field of view of course of 53mm.
4. The Galaxy S III was shot with the field of view adjusted digitally to match the above as close as possible.

One set of shots was taken with:

1. The Mamiya RB67 Pro S shot with my Mamiya KL 250mm f/4.5 that has a 35mm film field of view of 123mm. *(Please allow me to make a correction. Mamiya's KL 250mm f4.5L-A has an angle of view of 20 degrees. The 35mm equivalent lens is 118mm. This is from the Mamiya RB Interchangeable Lenses sheet as supplied with their lenses.)*
2. The Nikon D300 shot with my Nikkor AF 70-200 F2.8 at about 80mm which has a 35mm film field of view of 123mm.

3. The Nikon F4 shot with my Nikkor AF 70-200 F2.8 at 123mm which has a 35mm film field of view of course of 123mm.

The sensor on the D300 measures 23.6 mm x 15.7 mm and the Pixel Width is 4288 and the Pixel Height is 2848. Roughly this gives a sensor of 4600 px/in. When scanning the film negatives I wanted to get as close to this as possible while still using the scanning capabilities of a lab so that the limitations of my own home scanner and my talent in using it did not add another variable into the process. The lab I used scanned the 35mm negatives at 5035px x 3339px. Giving the size of the 35mm negative at 36mm x 24mm this gives an average resolution of 3543 px/in. The lab I used scanned the medium format negatives at 5902px x 4815px. Giving the size of the negative on my Mamiya RB67 is 68mm x 56mm this gives an average resolution of 2195 px/in. I did not calculate the resolution of the Galaxy S III. This is not perfect and gives a slight advantage to the digital images from the D300 but it is the best I could do.

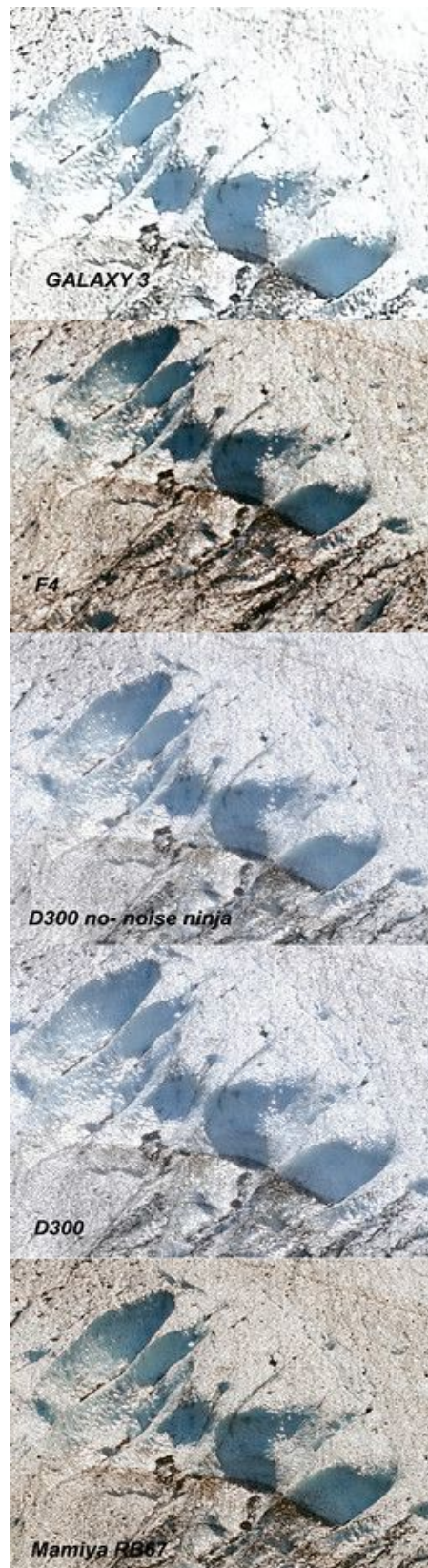
The white balance on the D300 and Galaxy S III was set on Automatic. The Galaxy S III and D300 images were processed in Photoshop Elements adjusting their levels and applying the filter Noise Ninja mainly to correct for the anti-aliasing filter in these cameras. Film images were not modified in Photoshop Elements.

Before I get into the images themselves and the results you will have to excuse me as some of the images have exposures that are not ideal. Also, the actual colors are not identical as there are obvious differences between the way that a digital sensor and the chemical on a piece of film reveal colors to the human eye. These inconsistencies are really not very important though as the primary purpose of this test was to compare the resolving powers of these different modes of image taking. Well let's get to the images.

Big Four Ice Caves



Big Four Ice Caves 100%



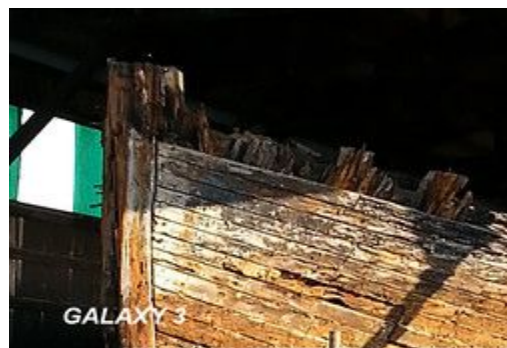
The first set of images is of the Big Four Ice Caves only about a 3/4 walk off the Mountain Loop Hwy outside of Granite Falls in Washington State. These images were taken late this August. The snow field here (not a glacier) remains year round due to its north facing orientation, its location at the base of the steep Big Four Mountain, and the fact that this part of the Mountain Loop Hwy gets over 100 inches of rain or snow a year. The ice caves you see form from the melting snow and are very, very dangerous to enter as they could easily collapse. This does not deter people from entering them of course. The overall images are seen below stacked as Galaxy S III, Nikon F4, D300 with no noise ninja processing, D300 with noise ninja processing, Mamiya RB67. In these overall pictures the differences in the resolving powers of these various image capturing devices is not evident. If we look at these same images at 100% though the differences become apparent.

What is obvious here is the poor resolving power of the Galaxy S III which would be expected. What surprised me though was the fact that the D300 image, especially the one with the noise ninja filter applied, seemed to have an obviously higher resolving power than the Nikon F4. As one might expect the Mamiya RB67 image had the highest resolving power though the D300 gave it a pretty good run for its money.

The Equator



The Equator 100%



One sample set is of course not enough so let us look at another one with a totally different subject. In a lonely spot in a parking lot in the Everett Washington marina sits The Equator. This boat is the schooner that carried Robert Louis Stevenson (of Dr. Jekyll and Mr. Hyde and Treasure Island fame) on a trip to Micronesia in 1889. The boat was abandoned here in 1957 and was listed on the National Register of Historic Places in 1972. The full and 100% images here were taken in a similar fashion as those of the Ice Caves above.

The resolving power differences are not extremely evident from the full images again, but the poorness of the Galaxy S III is still noticeable. At 100% the superiority of the D300 image over the Nikon F4 is easily seen especially in the image treated with noise ninja. Although there are exposure differences between the D300 and Mamiya RB67 image, the D300 comes very close to matching the resolving power of the medium format negative.

Keeler's Korner



Keeler's Korner 100%



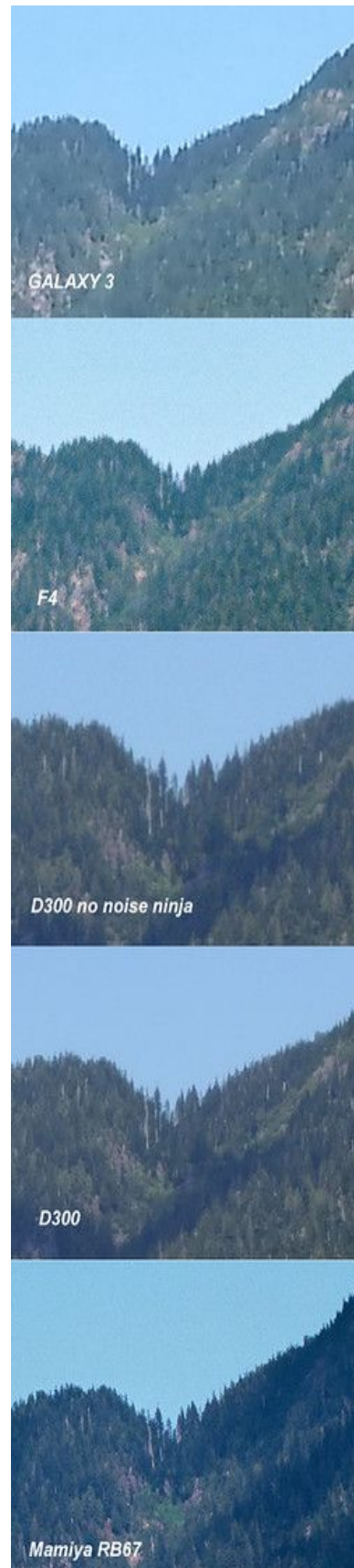
Let us now move to the use of another lens, this time using my Mamiya KL 250mm f/4.5 on the Mamiya RB67 and my Nikkor AF 70-200 F2.8 on the D300 and Nikon F4. This time our subject is Keelers Korner, a historic gas station in Hwy 99 in Lynnwood Washington. This too is on the National Register of Historic Places. For this comparison no images were taken with the Galaxy S III.

The results seem the same even with different lens. The full images show little difference in resolving power but at 100% the Mamiya RB67 wins out with this time the D300 with the noise ninja filter applied coming in a very close second.

Dickerman Mountain



Dickerman Mountain 100%



For our last series of images we have Dickerman Mountain off the Mountain Loop Hwy. This is chosen due to the resolving power that can be discerned by looking at the conifer tree limbs near the crest of the mountain.

Again, viewing the images at 100% tells the story. Here we can see how much more resolving power the Nikon F4 has over the Galaxy S III. We can easily see how much resolving power it added to the D300 image by using the noise ninja filter to reverse the effects of the camera's Anti-aliasing filter. Lastly, in the valley at the crest of this mountain viewed at 100% it is very easy to see at the interface between the sky and the trees how much more resolving power the Mamiya RB67 has over the D300.

Conclusions:

Obviously going from lowest resolving power to highest resolving power of these image makers this analysis shows:

Galaxy S III - Nikon F4 - D300 with no noise ninja filter - D300 with noise ninja filter - Mamiya RB67.

One caveat must be added in that the film scans were dry scans and if wet scans were done perhaps the Nikon F4 images would have come closer to the resolving power of the D300 and the Mamiya RB67 images would have far exceeded those of the D300 instead of just nudging them out in many cases. Also, film is meant to be printed optically with the process of scanning these images to get them onto a computer adding to the potential degradation of the final product. Perhaps optical prints of the film images compared with prints of the digital images would have aided in the resolving power of these traditional images. As to whether the Mamiya RB67 images with an optimal wet scan could match those of say a Nikon D810 or a medium format digital camera I cannot say as I do not own any of these and cannot see me owning one anytime soon. It is interesting

though that this Mamiya RB67 Pro-S that is at least 24 years old, has the possibility of producing images that rival current digital cameras costing thousands or tens of thousands of dollars (and it does not need electricity!)

Well, am I going to toss my digital camera and use my Mamiya RB67 exclusively? Certainly not. The images produced by the Mamiya RB67 are better but it is a manual focus camera, its heavy, it has a very limited shutter speed range, and the lens are not that fast. If there is a moving target there is no question that the D300 with its light weight, auto-focus, ability to change the ISO value, and the range of fast lens I have, is the camera to have in your hand. The right tool for the right job as they say. What about the Nikon F4 and my manual focus Nikon 35mm cameras? I will still use them because, well, I like them and they produce more than acceptable images. As for the Galaxy S III, well it is a phone not a camera and thus is best used for what it was primarily built for.

Originally from Detroit, but have lived in the Pacific Northwest for the last 30 years

BS Chemical Engineering, Michigan State University, 1983

You name a type of chemical processing plant, I've designed one

Interests:

Sea Life

Photojournalist

Historian see 63 Alfred Street (63alfred.com)

Engineering (JavaScript programming for on-line calculators)

(FreeCalc.com)

Inventor (steadfastequipment.com)

Android programmer 63 Alfred Android Apps

Reef Keeper

Bike Commuter Components of Electric Bike Build, 2011

The Details

Quote:

“Engineering was an interesting way to make a living till the MBA’s SUCKED all the fun out of it.”

Current equipment includes: Nikon D70, Nikon D300, Nikon FE, Nikon F4, Nikon FA, Mamiya RB67 Pro S, Minolta hi-matic 7sii, Argus C-3, Afga Record III, Nikkor AF 17-70 F3.5-4.5, Nikkor AF 70-200 F2.8, Nikon AF 35-70 F2.8, Nikon AF 85mm F1.8, Nikon AF TC-20EII Teleconverter, Tamron SP 90mm f/2.8 Di Marco, AF-S NIKKOR 50mm f/1.4G, Nikkor ED 500mm 1:4P (with Wimberley Sidekick gimbal-type head), Nikkor 300mm f/4 IF-ED, Nikon 50mm f/1.8 manual, Mamiya Sekor 90mm f3.8 , Mamiya KL 250mm f/4.5, Mamiya C 37mm f4.5, 45mm NIKKOR GN (pancake), Nikkor 50mm f/1.2 AI-s, UV pinhole rig, Photoshop Elements 6, MacBook Pro, Manfrotto tripod/Giotto's Ball Head, Manfrotto 680B monopod, GorillaPod SLR-Zoom, Kata E-702 Rain Cover (I do live in Seattle after all), 1.4X to 8X Macro/photomicrography setup jig, and various camera bags.